Last Lecture

Cont. Being Social, Chapter 3
Evolution of Human Behavior, Chapter 14
Is there a reason to be social?

What are the benefits of sociality?

1. Cooperation, both benefit
2. Postponed cooperation (delayed resource)
3. Reciprocity (delayed benefit)
4. Altruism
Any problems with being social?

What are the costs of being social?

- Maladaptive altruism
- Spite
- Manipulation and deceit
- Not to mention disease and parasites
The Prisoner's Dilemma

<table>
<thead>
<tr>
<th>Prisoners' dilemma</th>
<th>prisoner B</th>
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<tbody>
<tr>
<td>confess B</td>
<td>remain silent B</td>
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<table>
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<tr>
<th>prisoner A</th>
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So when do you cooperate?

Vampire bats share their blood meals. Need to eat regularly or die.

But who are you helping? Need to look at DNA to know.
Cost of cooperation

Belding's Ground Squirrels: alarm call results in higher rate of predation on caller.

So why call?
Cost of cooperation

Sherman found callers are more likely to be females, who don't migrate. She is more likely to call if living near other relatives. Therefore, supports indirect or kin selection.
Helping at the Nest

Pied Kingfisher males. First year have 3 options:
1. Help your parents (primary)
2. Help an unrelated pair (secondary)
3. Do nothing.
Helping increases inclusive fitness in pied kingfishers

Males either help at home (primary helper), help elsewhere (secondary helper) or delay breeding for a year

<table>
<thead>
<tr>
<th>Behavioral tactic</th>
<th>First year</th>
<th>Second year</th>
<th>Total</th>
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<tbody>
<tr>
<td></td>
<td>$y$</td>
<td>$r$</td>
<td>$f_1$</td>
</tr>
<tr>
<td>Primary helper</td>
<td>$1.8 \times 0.32 = 0.58$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary helper</td>
<td>$1.3 \times 0.00 = 0.00$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delayer</td>
<td>$0.0 \times 0.00 = 0.00$</td>
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</tbody>
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Symbols: $y =$ extra young produced by helped parents; $o =$ offspring produced by breeding ex-helpers and delayers; $r =$ coefficient of relatedness between the male and $y$ and $o$; $f_1 =$ fitness in first year (indirect fitness for the primary helper); $f_2 =$ direct fitness in second year; $s =$ probability of surviving into the second year; $m =$ probability of finding a mate in the second year.

Source: Reyer [964]
Eusocial Mammal

- The naked mole rat.
- [https://www.youtube.com/watch?v=eHi9FvUPSDQ](https://www.youtube.com/watch?v=eHi9FvUPSDQ)
- Very unusual mammal.
- R. Alexander, after reading Hamilton's work, predicted the characters of a eusocial mammal and was correct! Underground, rodent, safe, expandable territory, food large and scattered, defendable, hard ground, Africa.
Caste System

Roles within the group

Only 1 female reproduces and she enforces sterility by keeping stress hormones high.

Dispersal is very difficult

Lack pain receptors, resist cancers, don't thermoregulate, and live a long life.

Not inbred so not like hapldiploidy.
Human Behavior

Let's address what we have learned about other species to humans.

First, write a personal ad for one who is hoping to find a partner for marriage.
Remember Trivers

- **Parental investment**
  - Males can create many, cheap gametes and increase fitness with many partners.
  - Females can only produce few gametes and need to make breast milk for the offspring. Therefore can increase fitness with high quality partners.
  - What about marriage and male fitness? Would the ad change if you were to write it for a temporary relationship?
What are we looking for?

- Physical attraction in both sexes tied to symmetry. Not limited to western culture
What are females looking for?

- Physical attraction and masculine features indicating testosterone.
- Cost of testosterone, suppresses the immune system. Good genes to overcome this!
- Would this be different pre- or post-reproductive?
Females prefer providers

- In cultures without birth control, females have increased fitness if their spouses are “rich”.
- Effect of wealth on health of children in western societies.
- Both looks and measures of ability to provide are important but the second may be more important to females (research).
- Women, did your ad contain anything about ability to provide?
Are females getting good genes for their offspring?

- Maybe. What are good genes?
- Sexy sons?
- MHC(major histocompatibility complex)-genes involved in the immune response.
- Heterozygous offspring have an advantage.
T-shirt sniffing

- Men wear the t-shirt with no perfumes, deodorant, etc.
- Women smell the t-shirts and state their preferences.
- When ovulating, prefer smell of MHC that is different from their own.
- When with a man with similar MHC, more likely to be dissatisfied and seek EPC
What do males prefer?

Signs of youth: full lips, small noses, intermediate weight, full breasts, narrow waist.

Why the preference for youth?

Fecundity!

Some evidence on body shape and fertility.
Fecundity and Estrogen Levels

Estrogen increases when ovulation occurs. Cues in face, walk, smell and voice. Who knew!
Lap dancing experiment

Lap dancers on the pill vs. those not on the pill.

Ovulating vs. non-ovulating.

Who got higher tips?

About twice as high when ovulating.
Sexual Conflict

- Men might seek to increase their fitness with more than one partner.
- 83% of pre-industrialized societies had a polygynous option.
- What does polygyny do to female fitness? It goes down.
- Prostitutes, pornography, etc. Where does this fit in?
Sexual Conflict - number of partners you would like to have

![Graph showing the number of partners over time for males and females.](image)
Sexual Conflict - likelihood of sex by time

**FIGURE 10.3** Sex differences in the probability of consenting to sexual intercourse after having known an attractive member of the opposite for varying time interval (3 = definitely yes; 2 = probably yes; 1 = possibly yes; 0 = neutral; −1 = possibly not; −2 = probably not; −3 = definitely not). Note that, on average, male students reached the neutral point after about 1 week, a point in time at which virtually all female students were saying definitely not; on average, female students reached the neutral point after 6 months. Reprinted from Buss and Schmitt (1993) with permission from the American Psychological Association.
Yes, there are differences.

- Note that females are not planning/hoping to have only 1 partner.
- Is there any evolutionary advantage to infidelity by females? How do humans respond to female infidelity vs. male?
- What about jealousy?
Coercive /Forced Sex

Is this a topic that can be understand by evolutionary theory?

Culture vs. biology?

Thornhill proposed that rape is adaptive as a reproductive strategy for men without other options.

Or could be a maladaptive effect of selection for other aspects of sexual behavior.

Only little date but fitness cost is high compared with benefit